

5.15 HAZARDOUS MATERIALS HANDLING

This section discusses storage and use of hazardous materials during the site preparation, construction, and operational phases of the proposed MPP. Design features have been incorporated into the MPP regarding the use of hazardous materials, especially their storage, to keep maximum potential impacts below defined thresholds of significance. Hazardous waste generation and management are further discussed in Section 5.14, Waste Management.

The discussion below includes the existing conditions; the environmental consequences associated with hazardous materials usage during site preparation, construction, and operation of proposed MPP; cumulative impacts; mitigation measures; and applicable LORS.

5.15.1 Affected Environment

The MPP will be located in an area zoned for commercial/industrial uses. Hazardous materials are used at the existing COB site and at surrounding light industrial/commercial sites. Surrounding land uses include Magnolia Boulevard and commercial/light industrial development (e.g., International Electrical Research Center, 3D Plastics) to the north; Olive Avenue and commercial/light industrial development (e.g., Metro RV Sales, Borman Steel) to the south; the Burbank Western Channel (e.g., a west feeder of the Los Angeles River), and commercial/light industrial development (an MTA lot and station) to the east; and Lake Street and commercial/light industrial development (a rental facility, lumberyard, and various auto repair facilities) to the west. Residential development in the immediate vicinity of the site is not anticipated. Sensitive receptors were identified within 2 miles of the project area. See Section 5.16 (Public Health) for additional information on sensitive receptors.

The plans for the proposed project include demolition of the remaining components associated with the existing Units 1 and 2, and construction of a combined-cycle plant. A detailed description of the proposed MPP is presented in Section 3.0, Facility Description. There are no new offsite transmission lines required for the project.

According to the Hazardous Materials Business Plan (HMBP) maintained by the existing COB site, a variety of hazardous materials are currently stored and used at the existing COB facility. A map of detailed hazardous material locations is provided in the 2000 HMBP. The HMBP is included in Appendix M of this AFC. A summary of hazardous materials to be used and stored at the MPP is provided in Table 5.15-1.

TABLE 5.15-1**HAZARDOUS MATERIALS AND WASTES USAGE AND STORAGE
DURING CONSTRUCTION AND OPERATIONS¹**

Material	Purpose	Usage/Day	Maximum Stored	Storage Type
Acetylene	Welding	As needed	270 cf.	Cylinder
Ammonium bifluoride (NH ₄ HF ₂)	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Aqueous ammonia ([19%] NH ₄ (OH))	NO _x emissions control.	300 lbs/day	12,000 gal.	Underground tank
Argon	Welding	As needed	270 cf.	Cylinder
Betz PL 1200 P	Oxygen Scavanger	5 gal.	275 gal.	drums
Betz Steamate NA 0160	Organic amine type corrosion inhibitor for steam	As needed	0	portable vessel
Betz NA 0240	Organic amine type corrosion inhibitor for steam	2 gal.	250 gal.	Portable vessel
Betz Optisperse	Boiler feedwater pH adjustment	As needed	110 gal.	Drums
Betz Spectrus OX1201	Cooling tower biocide, oxidizing type	2 gal.	400 gal.	Portable vessel
Betz Foamtrol 4440	Cooling tower antifoam	2 gal.	110 gal.	Portable vessel
Betz AZ8104	Cooling water copper inhibitor	25 gal.	275 gal.	Portable vessel
Betz Dianodic DN 2301, nonhazardous as defined by OSHA regulations	Cooling water scale and deposit control	10 gal.	600 gal.	Portable vessel
Betz 3200	Recirculating cooling water molybdate type corrosion inhibitor	10 gal.	40 gal.	Carboy
Citric acid	Chemical cleaning of HRSG, feedwater systems	As needed	Temporary only	Portable vessel
Diesel fuel oil	Emergency generator	As needed	2,000 gal.	Tank, UL C.S.
EDTA chelant	Chemical cleaning of HRSG, feedwater systems	As needed	Temporary only	Portable vessel
Hydrochloric acid (HCl)	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel

TABLE 5.15-1**(CONTINUED)**

Material	Purpose	Usage/Day	Maximum Stored	Storage Type
Lubricating oil	--	As needed	10,000 gal.	Lubricating sumps of turbine and combustion and steam
Mercury	Instruments and controls	As needed	0	Bottle
Mineral oil	Transformers	As needed	1,000 gal.	Transformers
Nitrogen	Transformers	As needed	275 cf.	Cylinder
Oxygen scavenger solution	Feedwater oxygen control	6 lb	300 gal.	Portable vessel
Oxygen – gaseous	Welding operation	As needed	275 cf.	Cylinder
Paint	Paint shack	25 gallons	100 gal.	Can
Sodium hydroxide	Spill neutralization	As needed	2 gal.	Carboy
Sodium hypochlorite (12% wt NaOCl)	Biocide for condenser cooling water system water treatment	109 gal.	7,500 gal.	Aboveground storage tank, plastic
Sodium metabisulfate	Dechlorination of Discharge 001	300 gal.	4,5000 gal	FRP Tank
Sodium nitrite (NaNO ₂)	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Sulfuric acid for station batteries	Electrical/ctrl. bldg., Combustion turbine, miscellaneous	As needed	100 gal.	Battery Battery Battery
Asbestos containing debris	Hazardous waste storage area and accumulation areas	2,000 lb	15,000 lb	Steel drum
Waste lubricating oil	Hazardous waste storage area and accumulation area	220 lb	550 lb	Steel drum
Waste mineral oil for transformers	Hazardous waste storage area and accumulation area	110 lb	330 lb	Steel drum
Waste oil and solvent	Hazardous waste storage area and accumulation area	450 lb	1,350 lb	Steel drum
Waste paint and thinner	Hazardous waste storage area and accumulation area	55 lb	110 lb	Steel drum

TABLE 5.15-1
(CONTINUED)

Material	Purpose	Usage/Day	Maximum Stored	Storage Type
Waste paint chips and debris (with benzene and lead)	Near Paint shack and hazardous waste storage area	110 gal.	165 gal.	Steel drum
Waste paint solids/sludge	Hazardous waste storage area and accumulation area	55 gal.	165 gal.	Steel drum
Waste oil contaminated soil/solids	Hazardous waste storage area and accumulation area	220 lb	1,100 lb	Steel drum
Waste solvent and debris	Hazardous waste storage area and accumulation area	55 lb	110 lb	Steel drum

¹ All numbers are approximate.

5.15.2 Environmental Consequences

The following sources are referenced in support of the identification and assessment of hazardous materials within this AFC section: *Sax's Dangerous Properties of Industrial Materials* (Lewis, 1992) and the *NIOSH Pocket Guide to Chemical Hazards* (National Institute for Occupational Safety [NIOSH], 1997).

5.15.2.1 Site Preparation

Hazardous materials to be used during site preparation include gasoline, diesel fuel, oil, anti-freeze and lubricants. There are no feasible alternatives to these materials for operation of construction vehicles and equipment. Hazardous materials identified as potentially hazardous waste materials that would be generated during site preparation are discussed in Section 5.14, Waste Management. Potential ACMs and lead-based paint will also be removed during the site preparation.

Impacts associated with the use of fuels, anti-freeze, oil and lubricants are expected to be insignificant. The removal of ACMs and lead-based paint during site preparation is discussed in Section 5.14.2.2.1. Implementation of ACM and lead-paint abatement in accordance with Section 5.14.2.2.1 is expected to result in insignificant impacts during site preparation.

5.15.2.2 Construction Phase

Hazardous materials to be used during construction include gasoline, diesel fuel, oil, lubricants, solvents, adhesives, and paint materials. There are no feasible alternatives to these materials for construction or operation of construction vehicles and equipment. No acutely hazardous materials (AHMs) will be used or stored onsite during construction. No storage of hazardous materials is planned outside of the plant site.

In general, construction contractors will utilize lubricating oils, solvents and other hazardous materials during demolition and construction of the new facilities. The contractor will be responsible for assuring that the use, storage and handling of these materials will be in compliance with applicable federal, state, and local LORS, including licensing, personnel training, accumulation limits, reporting requirements and recordkeeping. The HMBP at the existing COB facility outlines hazardous materials handling, storage spill response, and reporting procedures.

The following site services will also be provided, either by separate contract or incorporated into individual construction subcontracts for the MPP:

- Environmental health and safety training
- Site security
- Site first aid
- Construction testing (e.g., soil, concrete)
- Furnishing and servicing of sanitary facilities
- Trash collection and disposal
- Disposal of hazardous materials and waste in accordance with local, state, and federal regulations.

Small quantities of spilled fuel oil and grease drippings from construction equipment may occur during construction. Such materials generally have a low relative risk to human health and the environment. If there is a large spill, the spill area will be bermed or controlled as quickly as is practical to minimize the footprint of the spill. Contaminated soil materials produced during cleanup of a spill will be placed into barrels or trucks by service personnel for offsite disposal as a hazardous waste at a permitted hazardous waste, transfer, storage, and disposal facility. If a spill or leak into the environment involves hazardous materials

equal to or greater than the specific reportable quantity, federal, state, and local reporting requirements will be adhered to. In particular, the COB Fire Department will be notified. The COB Fire Department will also be called in the event of a fire or injury. Contractors will be expected to implement best management practices consistent with hazardous materials storage, handling, emergency spill response, and reporting specified in the HMBP. Impacts associated with the use of hazardous materials will be insignificant as a result of the MPP implementing the HMBP procedures.

5.15.2.3 Operations Phase

The major hazardous materials to be stored and/or used at the site during MPP site operations are included in Table 5.15-1. A map of hazardous material locations within the existing COB facility is provided in the 2000 HMBP.

The following potential hazards associated with the storage of hazardous or acutely hazardous materials were identified:

- Fire and explosion from the use of natural gas, and other gases
- Accidental release of aqueous ammonia.

5.15.2.3.1 Fire and Explosion Risks.

Natural Gases. Natural gas, which will be used as a fuel for the MPP, poses a fire and/or explosion risk as a result of its flammability. While natural gas is used in significant quantities, it is and will be continuously delivered to the generating plant site through a pressurized natural gas pipeline and will not be stored onsite. There are no changes proposed to the gas pipeline; therefore impacts to the affected environment will not change. The risk of a fire and/or explosion will be minimized through adherence to applicable codes and the continued implementation of effective safety management practices.

Other Gases. Other gases currently stored and used at the facility include gases typically used for maintenance activities such as shop welding and emissions monitoring. These gases include small amounts of acetylene, argon, carbon monoxide, nitric oxide, nitrogen, and oxygen. The potential impacts presented by the use of these gases are not considered to be significant based on the following:

- A limited quantity of each gas is stored at the facility.
- The gases are stored in DOT-approved safety cylinders, secured to prevent upset and physical damage.

- Incompatible gases (e.g., flammable gases and oxidizers) are stored separately.
- The gases are stored in multiple standard-sized portable cylinders, in contrast to larger cylinders, generally limiting the quantity released from an individual cylinder failure to less than 200 cubic feet.

There will be no significant changes resulting from the proposed MPP. Therefore, the potential impacts presented by the use of these gases at the facility will not change and are considered insignificant.

5.15.2.3.2 Acutely Hazardous Materials. The chemicals proposed for use at the MPP site are not Regulated Substances subject to the requirements of the California Accidental Release Prevention (CalARP) Program and process safety management (PSM), with the exception of aqueous ammonia (approximately 19% solution) which will be stored in a single 12,000-gallon, double-walled aboveground storage tank.

In September 1996, Senate Bill (SB) 1889 was enacted to change the California Health and Safety Code (CHSC) § 25531 et. seq., replacing the Risk Management and Prevention Program (RMPP) requirements with the Risk Management Plan (RMP) requirements established pursuant to Section 112(r) of the federal Clean Air Act (42 USC Section 7412). Pursuant to SB 1889, the California Office of Emergency Services (OES) is required to adopt implementing regulations, initially as emergency regulations, and to seek and maintain delegation of the federal program. The CalARP Program merges federal and state programs for the prevention of accidental releases of regulated toxic and flammable substances. The goal was to eliminate the need for two separate and distinct chemical risk management programs. The CalARP Phase I Final Regulations were approved on November 16, 1998.

The CalARP Program final regulations (CCR Title 19, Division 2, Chapter 4.5) provide two sets of lists of Regulated Substances: one for Federal Regulated Substances and one for State Regulated Substances.

- Section 2770.5 – Tables 1 and 2 of Section 2770.5 list Federal Regulated Substances and threshold quantities for accidental release prevention, including flammable substances. Aqueous ammonia, hydrochloric acid, sulfuric acid, and cyclohexylamine are on the list. The quantities of aqueous ammonia, hydrochloric acid, and cyclohexylamine proposed for use after MPP implementation do not exceed the threshold quantity limits and therefore are not regulated substances in this setting.
- Section 2770.5 – Table 3 of Section 2770.5 lists State Regulated Substances and threshold quantities for accidental release prevention. Aqueous ammonia, sulfuric acid and cyclohexylamine are included on this list. The quantities of hydrochloric acid and

cyclohexylamine proposed for use after MPP implementation do not exceed the threshold quantity limits, and therefore are not regulated substances in this setting. The proposed quantity of aqueous ammonia does, however, exceed the threshold quantity limits.

Based on the above regulations and the future use of aqueous ammonia at the MPP, an RMP is required and will be submitted to the COB Fire Department.

No special regulatory requirements or management practices related to the storage or use of sulfuric acid, hydrochloric acid, or neutralizing amine (containing cyclohexylamine) are anticipated.

An Offsite Consequences Analysis (OCA) for accidental releases of aqueous ammonia has been conducted in accordance with CEC regulations. The analysis is included in Section 5.15.2.3.

5.15.2.3.3 Other Hazardous Materials. No adverse environmental impacts related to other hazardous materials used at the facility are anticipated. Only small quantities of paints, oils, solvents, pesticides, and cleaners, typical of those packaged for retail consumer use, are or will be present during operation of the facility. Small volumes of petroleum products associated with construction equipment will be onsite during construction. As described in Sections 5.15.2.2 and 5.15.3.1, long-term or cumulative impacts will be avoided by cleaning up any accidental leaks or spills of these materials as soon as they occur.

5.15.2.3.4 Material Safety Data Sheets. Material Data Safety Sheets for the hazardous materials will be kept onsite as required by 29 CFR 1910 OSHA Hazard Communication rules and regulations.

5.15.2.4 Offsite Consequence Analysis

This section presents an OCA, or evaluation of potential acute public health impacts from an accidental release of a Regulated Substance stored in amounts exceeding threshold planning quantities (TPQs). An SCR will be used to reduce air emissions of nitrogen oxides (NO_x). The SCR relies on ammonia to reduce NO_x emissions in the presence of a catalyst. The aqueous ammonia to be used for the SCR air pollution control system would be the only Regulated Substance stored in an amount exceeding an applicable TPQ.

The OCA was performed for an accidental release scenario identified as “worst case.” The hypothetical release scenario examined was an accident during truck unloading, which is further described below. Zones of vulnerability were then assessed using a computer model that predicts the airborne migration and concentration of the ammonia. Potential short-term health effects were evaluated from the estimated zones of vulnerability.

The OCA described in detail below includes four components. The first is an estimation of emission rates associated with the hypothetical release. The second is an evaluation of historical meteorological data to determine the frequency of occurrence of various meteorological conditions. The third is atmospheric dispersion modeling using both the emission rates and meteorological data to predict the extent of potential vulnerability zones associated with the hypothetical, worst-case release. Finally, the fourth component assesses the potential degree and extent of offsite consequences based on the dispersion modeling results.

Section 5.15.2.3.1 summarizes the worst-case release scenario and emission estimates. Section 5.15.2.3.2 describes ammonia health criteria and health effects that could occur from ammonia exposure. Meteorological data is discussed in Section 5.15.2.3.3. Section 5.15.2.3.4 presents the atmospheric dispersion modeling methodology. Results are discussed in Section 5.15.2.3.5, including an exposure assessment for potential receptors in the project area.

5.15.2.4.1 Release Scenario. There will be a single 12,000-gallon tank for storing aqueous ammonia at 19 percent concentration. Potential accidental release scenarios due to aqueous ammonia handling and use include losses from the storage tank, losses during unloading to the storage tanks, losses in the liquid ammonia delivery system from the storage tank to the vaporizer, and losses of vaporized ammonia during delivery to the SCR catalyst beds. All of these portions of the ammonia storage and handling systems were evaluated. Because of safety shut-off systems associated with delivery of aqueous ammonia from the tank to the vaporizer, and of ammonia vapor to the SCR, potential ammonia release quantities from these system components in the event of an upset condition are small compared to losses from the storage tank or from truck unloading.

Facility Design. The storage tank will be designed as either an aboveground or underground double-walled tank. In the event of a failure of the inside tank wall, tank contents will be contained within the exterior tank wall. This “passive” mitigation system does not require any further mechanical systems to contain the tank contents. Since this passive mitigation will be in place and in case of an aboveground tank, the probability of a double-wall rupture leading to an atmospheric release is extremely unlikely, the truck unloading accident was identified as the “worst-case” scenario.

The aqueous ammonia unloading station will be located adjacent to the ammonia storage tank. The unloading area will be equipped with a floor that will slope to a center drain. A containment vault, adequate to hold a full truckload of aqueous ammonia and a quantity of wash-down water, will be located adjacent to or below the floor and drain.

Ammonia Release Scenario. The accidental release scenario occurs during truck unloading. The spilled aqueous ammonia splashes as it releases and drains to the underground containment vault, after which time ammonia will evaporate only through the 10-inch opening

of the inlet drain. The resulting emissions release is assumed to last 60 minutes until the vault can be closed.

Release assumptions are summarized below. Release rates, which assume liquid temperatures that are 20° F above ambient temperatures, are summarized in Table 5.15-2. The ambient temperatures analyzed were 110° F (the maximum summertime temperature for the meteorological data set used), 85° F (representative of average maximum temperatures), and 67° F (the annual mean temperature for Burbank obtained from 1981 meteorological data from the SCAQMD). The assumption that the aqueous ammonia temperature inside the underground contaminant vault would be 20° F above ambient air temperature provides for a conservative calculation of the evaporation rate, since the liquid temperature inside the vault would not be expected to be this high.

TABLE 5.15-2
MAGNOLIA POWER PROJECT
ACCIDENTAL RELEASE SCENARIO RELEASE RATES

Ambient Temperature (°F)	Wind Speed (m/s)	Assumed Liquid Temperature (°F) ¹	Release Rate (g/s)
110	1.5	130	0.129
110	1.3	130	0.116
85	1.5	105	0.093
85	1.3	105	0.083
67	1.5	87	0.068
67	1.3	87	0.061

¹ Released aqueous ammonia assumed to be 20° F higher for conservative calculation of evaporation rate.

Emissions due to evaporation of ammonia inside the containment vault were estimated from the following the U.S. Environmental Protection Agency (EPA) model for evaporative emissions from a single-phase low volatility liquid (EPA 1993):

$$E = 6.94 \times 10^{-7} (1 + 0.0043 (T_a - 273.15)^2) u_r^{0.75} A_p M (p_v / p_{vh})$$

where:

- E = emission rate (kg/s)
- u_r = ambient wind speed at 10-m altitude (m/s)
- T_a = ambient temperature (°K); here T_a must be greater than 273.15° K
- A = pool area (m²)
- M = molecular weight (kg/kgmol)
- p_v = vapor pressure of the chemical (Pa)
- p_{vh} = vapor pressure of hydrazine at T_a (Pa)

The value for p_{vh} is given by:

$$p_{vh} = \exp[76.8580 - (7245.2/T_a) - 8.22\ln(T_a) + 0.006155T_a]$$

The predicted emissions are a function of the “pool area,” ambient temperature, ambient wind speed, molecular weight of the liquid, and the vapor pressure of the ammonia above the liquid. For the purposes of this emissions assessment, the “pool area” was set equal to the opening of the 10-inch-diameter sump drain. The assumption here is that evaporation of ammonia inside the containment vault is accounted for by ammonia vapor pressure and temperature, and that ambient wind speed accounts for convection of the ammonia vapor from the effective emissions area (the drain opening).

Example Calculation for 110° F and 1.5-m/s Windspeed

Pool Surface Area:

Diameter = 10 inches = 0.254 m

$$A = \pi D^2/4 = \pi(0.254 \text{ m})^2/4 = 0.0507 \text{ m}^2$$

Ambient Temperature of 110° F (316.5° K); Ammonia Temperature 130° F (327.6° K):

Vapor Pressure of 19 percent ammonia: 817 mmHg (108,579 Pa) at 130° F (interpolated from data in Perry’s Chemical Engineer’s Handbook, 5th Edition, Table 3-23, p.3-68).

Vapor Pressure of Hydrazine: 9,415.1 Pa at 130° F (calculated from equation above)

$$E = [6.94 \times 10^{-7} (1 + 0.0043 (327.6 - 273.15)^2) (1.5)^{0.75} (0.0507) (17) (108,579) / (9,415)]$$

$$= 0.0001285 \text{ kg/s} = 0.1285 \text{ g/s}$$

5.15.2.4.2 Ammonia Health Criteria. Short-term exposures to airborne ammonia can cause skin, eye, and upper respiratory irritation. At extremely high concentrations, ammonia can be life threatening. Four levels of concern (LOC) were identified as a means to characterize worst-case impacts associated with the hypothetical release of ammonia. They are described below.

- **Lethality.** The lethality value is 2,000 parts per million (ppm) (30-minute averaging time). This lower limit value for lethality to human populations was obtained from the literature (Wray, 1991) and is used by the CEC in evaluating potentially lethal ammonia exposures.
- **Immediately Dangerous to Life and Health (IDLH).** The IDLH value is 300 ppm (30-minute averaging time). This is a worker protection value published by the NIOSH,

1997. Concentrations above IDLH values pose a threat to cause death or immediate or delayed adverse health effects or cause a condition to prevent escape from such an environment.

- **Emergency Response Planning Guideline Level 2 (ERPG-2).** The ERPG-2 value is 200 ppm (1-hour averaging time). The ERPG-2 value is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing any irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.
- **Short-Term Public Emergency Limit (STPEL).** The STPEL used by the National Research Council is 75 ppm (30-minute averaging time). The CEC uses this value as a guideline to assess potential acute public health impacts due to ammonia exposures. Concentrations below 75 ppm are believed to be insignificant.

5.15.2.4.3 Meteorological Data Analysis. Atmospheric dispersion modeling requires the input of various meteorological conditions. To assess prevailing wind and atmospheric stability conditions at the proposed MPP site, annual average wind roses were compiled by stability class from 1981 meteorological data from Burbank supplied by the SCAQMD. Atmospheric stability class is a measure of the atmosphere's ability to disperse pollutants, ranging from "A" (very unstable, high dispersion potential) to "G" (super stable, very limited dispersion potential). The meteorological data were used to determine the frequency distribution of wind speed, wind direction, and stability combinations. Low wind speeds and stable atmospheric conditions inhibit pollutant dispersion, resulting in higher pollutant concentrations. An annual wind rose is shown on Figure 5.15-1. Wind roses by stability class for 1981 are shown on Figures 5.15-2 through 5.15-8. Wind frequency distribution tables for these same data are in Appendix H. The wind roses indicate that the predominant wind directions are southeasterly (i.e., from the southeast) and east-southeasterly. The wind roses also indicate that the most common stability classes are F (stable) and D (neutral). For the purposes of this assessment, G stability (super stable) was combined with F stability (stable), since the EPA RMP Guidelines apply F stability as the most stable atmospheric condition. The most common wind speeds occurring under F or D stability were between 1.14-4.61 mph (0.51-2.06 m/s).

The EPA requires that OCA modeling be performed assuming a wind speed of 1.5 m/s with a stability class of F (stable). Three ambient temperatures were used in the dispersion modeling to assess potential impacts: 67° F (average ambient temperature from 1981), 85° F, and 110° F (the latter temperature being representative of maximum summer time conditions). These ambient temperatures were also used in the ammonia emissions calculations described above, which assume that the ammonia liquid temperature would be 20° F higher than ambient conditions.

5.15.2.4.4 Atmospheric Dispersion Modeling Methodology. Atmospheric dispersion modeling was performed to estimate downwind concentrations of ammonia for the hypothetical release scenario discussed in Section 5.15.2.3.1. The dispersion modeling provided a conservative estimate of the zone of vulnerability (the maximum downwind distance at which a specific level of concern may potentially be exceeded).

The atmospheric dispersion modeling used the EPA-approved SCREEN3 dispersion model, Version 96043 (EPA, 1995). SCREEN3 is a Gaussian steady-state dispersion model that can calculate potential ground-level air pollutant concentrations from either a point or area source. It is considered a screening-level model in that it predicts air pollutant concentrations for neutrally buoyant plumes based on ten-minute-average dispersion factors (which are conservatively taken to represent up to one-hour concentrations) under either: (1) a prescribed wind speed-stability class combination, or (2) an assumed array of potential wind speed-stability class combinations, reporting the maximum predicted concentrations at any downwind distance under any of the meteorological conditions in the array. Ammonia vapor is lighter than air. Therefore, emissions associated with the evaporating ammonia would mix rapidly with the surrounding air and result in a neutrally buoyant plume.

5.15.2.4.5 Discussion of OCA Results. The SCREEN3 model provides concentration outputs with respect to distance from the release location. The radius of influence (distance from the source) to each of the four identified LOCs (75 ppm, 200 ppm, 300 ppm, and 2,000 ppm) for the different meteorological conditions are summarized in Table 5.15-3. Figures 5.15-9, 5.15-10 and 5.15-11 are graphs which show concentrations of ammonia as they decrease with distance for the ambient temperatures of 110° F, 85° F, and 67° F, respectively. Figure 5.15-11 illustrates the radii of influence for the worst-case wind speed-stability class combination. The predicted worst-case impact is associated with an ambient temperature of 110° F (higher evaporation rate), and a wind speed of 1.5 m/s, and stability class of F (stable atmospheric conditions). The maximum distance to 75 ppm is approximately 20 meters and does not extend offsite. Dispersion modeling files can be found in Appendix H-14.

Even under worst-case meteorological conditions (F stability, 1.5 m/s wind speed), concentrations of ammonia are estimated to be 12.7 ppm at the fenceline (approximately 36 meters from the unloading area). The predicted fenceline concentration is well under 75 ppm, which is indicative of an insignificant impact.

TABLE 5.15-3**MAGNOLIA POWER PROJECT DISPERSION MODELING RESULTS**

Ambient Temperature (°F)	Wind Speed (m/s)	Stability Class ¹	Distance to Various Levels of Concern (m)			
			2000 ppm	300 ppm	200 ppm	75 ppm
110	1.5	F	2.6	9.3	11.6	19.7
110	1.3	D	-- ²	4.7	6.0	9.9
85	1.5	F	-- ²	7.9	9.4	19.3
85	1.3	D	-- ²	4.0	4.8	8.6
67	1.5	F	-- ²	6.3	8.1	13.4
67	1.3	D	-- ²	3.3	4.2	7.2

¹ Stability classes: F (very stable conditions); D (neutral conditions)

² The SCREEN3 Model did not calculate ammonia concentrations this high.

It is important to note that this offsite consequence analysis is ultra conservative, as required by the EPA RMP Guidance. For example, the worst-case meteorology used in the analysis of an ambient temperature of 110° F, F stability, and 1.5-m/s winds would not realistically occur simultaneously. Under actual typical conditions, stable atmospheres and low winds are associated with night and early morning conditions, when ambient temperatures are not expected to be this high. At a daytime temperature of 110° F, atmospheric stability with low winds would more likely occur under C or D stability due to thermal atmospheric mixing caused by daytime solar insulation. Conversely, F stability and 1.5-m/s winds are more likely to occur at overnight or early morning temperatures.

Furthermore, the worst-case analysis also gives no credit for active control measures included in the ammonia storage/receiving facility design, which include an indoor ammonia sensor tied to an automatic system that will shut all building vents in the event of elevated indoor ammonia vapor levels. This system would actually control releases to outdoor air to negligible levels. Truck delivery pad spill emissions will also be minimized by a water spray system, as mentioned above. Offsite (and onsite) outdoor ammonia concentrations are expected to be much less than predicted in the above worst-case analyses as a result of active control systems in the proposed design.

In summary, no significant offsite consequences at receptors of public health concern are expected to occur from the assumed worst-case ammonia release based on the results of the OCA. Power plant workers in the vicinity of the ammonia truck unloading area could be exposed to harmful concentrations of ammonia in the unlikely event of an accidental ammonia release. The proposed project design includes measures to reduce the likelihood and consequences of an accidental ammonia release. As discussed in Section 5.17 (Worker Safety),

workers at the power plant would be trained to avoid and respond to accidental releases of hazardous materials, including ammonia. The proposed project design and worker safety training limit the worker safety hazard due to an accidental ammonia release to an acceptable level. Persons within the unloading vicinity (e.g., occupational personnel) may need to take protective action upon detection of ammonia odors.

5.15.2.5 Cumulative Impacts

The COB Planning Department was contacted regarding future projects with the potential to handle hazardous materials in quantities that would create a potential cumulative impact in combination with the proposed MPP. No large-scale industrial developments are planned in the near future. Based on this information, no significant cumulative impacts due to hazardous material handling are expected from future projects in combination with the MPP.

Cumulative impacts considered for the MPP focused on accidental releases of hazardous materials. Specifically, the increased risk to public health and safety when multiple facilities handling hazardous materials were considered together with the proposed project.

The hazardous material that has the greatest potential to migrate offsite is aqueous ammonia. To determine cumulative impacts, other sites in the vicinity of the proposed project as well as planned projects with the potential to handle aqueous ammonia were identified and analyzed. In addition, sites handling hazardous materials that could negatively interact with ammonia and with the potential for offsite migration were identified, analyzed, and discussed in Section 5.15.2. Based on results of the OCA for the aqueous ammonia release scenario and the evaluation of other projects in the area, cumulative hazardous materials impacts for the MPP are expected to be insignificant.

5.15.3 Mitigation Measures

The CEC standard conditions provide appropriate mitigation and compliance conditions that ensure that the MPP utilizes hazardous materials in compliance with all applicable LORS, and in a manner that ensures no significant environmental impacts.

5.15.3.1 Construction Phase

During construction, hazardous materials to be stored onsite will be limited to small quantities of paint, coatings, adhesives, and emergency refueling containers. These materials will be stored in a locked utility shed or in a secured fenced area with secondary containment. It is anticipated that fuels, lubricants, and other various fluids needed for operation of construction equipment will be transported to the construction site on an as-needed basis by equipment service trucks. Personnel working on the project during

construction will be trained in handling hazardous materials, and will be alerted to dangers associated with these materials. An onsite safety officer will be designated to implement health and safety guidelines and contact emergency response personnel and the local hospital, if necessary.

Construction contractors for the MPP will be required to develop standard operating procedures for servicing and fueling construction equipment. These procedures will, at a minimum, include the following:

HAZMAT-1: The following measures will be implemented related to fueling and maintenance of vehicles and equipment:

- No smoking, open flames, or welding will be allowed in the fueling/services areas.
- Servicing and fueling of vehicles and equipment will occur only in designated areas.
- Fueling service and maintenance will be conducted only by authorized, trained personnel.
- Refueling will be conducted only with approved pumps, hoses, and nozzles.
- All disconnected hoses will be handled in a manner to prevent residual fuel and fluids from being released into the environment.
- Catchpans will be placed under equipment/hose connections to catch potential spills during fueling and servicing.
- Service trucks will be provided with fire extinguishers and spill containment equipment, such as absorbents, shovels, and containers.
- Service trucks will not remain on the job site after fueling and service are complete.

HAZMAT-2: Spills that occur during vehicle maintenance will be cleaned up immediately, and contaminated soil will be containerized and sent for subsequent evaluation and offsite disposal. A log of all spills and cleanup actions will be maintained.

HAZMAT-3: Emergency telephone numbers will be available onsite for the fire department, police, local hospitals, ambulance service(s), and environmental regulatory agencies.

HAZMAT-4: Containers used to store hazardous materials will be properly labeled and kept in good condition.

It is anticipated that these standard operating procedures will minimize the potential for incidents involving hazardous materials during construction.

5.15.3.2 Operational Phase

A listing of anticipated hazardous materials to be used onsite can be found in Table 5.15-1. General mitigation measures are detailed below for containerized and bulk hazardous materials.

5.15.3.2.1 General Mitigation Measures.

HAZMAT-5: Containerized Materials. Containerized materials will typically consist of returnable tanks (approximately 100-gallon capacity), 55-gallon drums, or 5-gallon pails of lubricants and oils, and smaller containers of paints and solvents. These materials will be managed as described below to mitigate potential releases.

- Hazardous materials will be stored in accordance with applicable regulations and codes, i.e., the Uniform Fire Code.
- Trucks delivering hazardous materials will be parked adjacent to the usage area or storage area where the chemicals are to be stored to minimize potential unloading and transportation accidents.
- Incompatible materials will be stored separately.
- Containerized hazardous materials will be stored in original containers appropriately designed for the individual characteristics of the contained material. Containers will be labeled with contents and identification of fire hazards as required by NFPA 704.
- Containers of flammable materials will be stored in inflammable storage cabinet(s) when not in use.
- Hazardous materials will be stored within secondary containment structures, typically constructed of sealed concrete. These structures will have capacity for the largest container plus an allowance for rainwater equivalent to a 24-hour, 50-year storm, if the area is out of doors. Alternatively, containerized hazardous materials may also be stored in commercially available hazardous materials storage sheds with built-in secondary containment.
- Commercially available secondary containment pallets may also be used for containers stored in warehouse facilities to augment other spill control measures.

- Empty containers, especially portable tanks and drums, will be emptied, drained, and returned to the supplier for reuse to the maximum extent possible, or recycled offsite.
- Pollution prevention efforts such as replacement of hazardous materials with less hazardous materials, reduction of hazardous waste generation volumes, and recycling will be employed at the facility, as practical.

HAZMAT-6: Bulk Hazardous Materials. Bulk hazardous materials at the facility will consist primarily of aqueous ammonia for emissions control of the SCR system. These materials will be stored in aboveground storage tanks with secondary containment of 110 percent of the tank volume plus an allowance for rainwater for a 24-hour, 25-year storm. Hazardous materials will be managed as described below to mitigate the potential for releases to the environment.

Each bulk chemical storage tank will be equipped with a local level gauge and a level switch. The level switch is interlocked with the storage tank high- and low-level alarms and the metering pump controls. The storage tank high-level alarm rings at the local common alarm panel when the storage tank level reaches the high level set point. The storage tank low-level alarm rings at the local feed system control panel, when the storage tank liquid level reaches the low-level set point.

Associated skid-mounted equipment includes the feed pumps, valves, interconnecting piping, controls, etc. A separate weatherproof control panel is mounted on each chemical equipment skid. Controls, instrumentation, and interlocks are provided for safe operation of the equipment during all modes of operation. The metering pumps will also be located within the secondary containment and will be elevated to prevent flooding during rainstorms.

Aqueous ammonia (19%) will be stored onsite in one 12,000-gallon tank. The tank will be double walled with the outer wall providing secondary containment. The aqueous ammonia will be delivered to the facility in tank trucks.

Out-of-doors secondary containment will employ a valve to empty the containment of rainwater, after a visual inspection to evaluate potential for contamination. The valve will be equipped with a lock and will remain locked shut unless rainwater is being actively emptied from the secondary containment. Contaminated water will run through the oil/water separator or will be disposed of offsite, as appropriate.

Tank trucks will be unloaded in a tank truck unloading area. This unloading area will be paved with concrete and with sufficient secondary containment to hold the contents of the worst case release scenario.

The ammonia truck unloading pad will be equipped with an underground containment vault. This vault will be specifically designed for minimization of ammonia evaporation in case of aqueous ammonia spills during truck unloading operations.

The containment vault noted in the above paragraph will be sealed with a non-reactive concrete coating to minimize potential migration of liquids from the vault into the surrounding soil. This vault will be emptied using a vacuum truck after a spill event had occurred. The truck pad will be covered to prevent the accumulation of rainwater in the vault.

Seismic loads for hazardous materials storage and containment areas will be determined by the static lateral force procedures of the Uniform Building Code and site-specific design features will be incorporated into these storage facilities. These structures will be designed and constructed in accordance with applicable codes, regulations, and standards.

Underground piping and piping runs outside of secondary containment structures will be constructed with double-wall (secondary containment) piping to minimize the potential for releases and enable the facility staff to detect leaks, when and if they should occur.

HAZMAT-7: Personnel Training and Equipment. Personnel working with chemicals will be trained in proper handling and emergency response to chemical spills or accidental releases. Additionally, designated personnel will be trained as a plant hazardous materials response team.

Safety equipment will be provided for use as required during chemical containment and cleanup activities, and will include safety showers and eyewash stations. Potable water hose connections will be provided near chemical usage and storage areas to allow flushing of chemical spills, if needed.

HAZMAT-8: Hazardous Materials Management - Plans and Procedures. Several programs are in place that will address hazardous materials storage locations: emergency response procedures; employee training requirements; hazard recognition fire safety; first-aid/emergency medical procedures; hazardous materials release containment/control procedures; hazard communication training; personnel protective equipment; training; and release reporting requirements. These programs will include the HMBP, workers safety program, fire response program, plant safety program, and facility standard operating procedures. The HMBP will include procedures on hazardous materials handling, use, and storage, emergency response, spill prevention and control, training, record keeping, and reporting.

As discussed previously, a Risk Management Plan for aqueous ammonia will also be prepared.

HAZMAT-9: Spill Response Procedures. The following describes the general Spill Response Procedures for the MPP. Personnel will be trained in spill response reporting and cleanup procedures. The facility will maintain onsite one or more spill response kits. These kits will contain absorbents appropriate for the hazardous materials kept onsite and each kit will be clearly designated for the type of spilled material it should be used for. Typically these kits contain a barrel, shovel, and absorbents. In addition, the facility will maintain a supply of gloves and protective clothing for use during spill response events.

Personnel discovering a spill will report to the on-shift Control Room Operator. The Control Room Operator will notify the Operations Superintendent or the Plant Engineer. The Superintendent or Engineer will contact as the Onsite Coordinator and will be in charge of activities related to spill containment, control and cleanup, and regulatory agency reporting, if needed.

The Onsite Coordinator will assess the situation, contain the leak or spill, begin cleanup operations with onsite staff or offsite contractors, as needed, and collect information for reporting, if needed. The following information will be needed for reporting:

- Type of chemical released
- Amount of release or spill, i.e., volume and description, liquid, vapor, etc.
- Direction of release and distance traveled if the release is outside the secondary containment
- Cause of spill or release
- Potential hazard to offsite personnel and local water bodies, including groundwater
- Actions undertaken to mitigate the spill or release.

Outside authorities, e.g., the Burbank Fire Department, Los Angeles County Fire Department, Emergency Medical Assistance, Office of Emergency Services, RWQCB, and California DFG, will be contacted if required by laws and regulations, or as deemed necessary by the Onsite Coordinator.

In the case of a small spill involving 55 gallons or less of liquid hazardous materials, the spill would typically be retained by a secondary containment structure. This type of spill would be confined to as small a space as possible using absorbent pigs or pillows, and be cleaned up with properly trained employees using absorbents available onsite. Similarly, small spills

outside of secondary containment structures could be cleaned up by trained employees with onsite spill kit equipment.

Larger spills would normally be contained within secondary containment and would be cleaned up by outside contractors using trained spill response personnel if onsite employees could not handle the spill using available onsite spill response equipment.

Waste generated from spill cleanup will be placed in closed, labeled containers, typically 55-gallon drums or roll-off containers. Labeling will include the name of the facility (MPP), date of start of accumulation, name of the spilled material, and Hazardous Waste identification language from CCR 22 66262.32, and the established DOT shipping name, as needed.

Collected waste would be properly disposed of offsite at an approved recycling, landfill, or other appropriate disposal facility. Offsite transportation of spill wastes will be contracted with a licensed hazardous materials transportation company. Hazardous waste spill cleanup residues will be properly manifested.

5.15.4 Applicable Laws, Ordinances, Regulations, and Standards

The LORS applicable to the MPP are discussed in this section in the context of hazardous materials handling. Construction and operation of the MPP will be in accordance with all applicable LORS pertaining to hazardous materials.

Federal, state, and local laws will govern the storage and use of hazardous materials and acutely hazardous materials at the MPP. Applicable laws and regulations address the use and storage of hazardous materials to protect the environment from contamination, and facility workers and the surrounding community from exposure to hazardous and acutely hazardous materials. The applicable LORS related to hazardous materials handling are summarized in Table 5.15-4.

5.15.4.1 Federal

The Superfund Amendments and Reauthorization Act of 1968 (SARA) Title III (Sections 302, 304, 311, and 313) and regulations pursuant to the Clean Air Act of 1990 (40 CFR 68) established a nation-wide emergency planning and response program, and imposed reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials. The Acts require the states to implement a comprehensive

TABLE 5.15-4**LORS APPLICABLE TO HAZARDOUS MATERIALS HANDLING**

LORS	Applicability	Conformance (Section)
Federal		
Clean Air Act (40 CFR 68)	Requires an RMP if listed hazardous materials are stored above threshold quantities (TQ)	Section 5.15.4.1
SARA Title III, Section 302	Requires certain planning activities when hazardous materials are present in excess of TQ.	Section 5.15.4.1
SARA Title III, Section 304	Requires notification if there is a release of hazardous materials in excess of TQ.	Section 5.15.4.1
SARA Title III, Section 311	MSDSs to be kept onsite for each hazardous materials. Required to be submitted to the City of Burbank Fire Department	Section 5.15.4.1
SARA Title III, Section 313	Requires annual reporting of releases of hazardous materials	Section 5.15.4.1
29 CFR, Section 1910.120, Occupational Safety and Health Administration (OSHA); Cal/OSHA	Describes worker safety and health procedures and safe handling of hazardous materials and wastes.	Section 5.15.4.1 and 5.15.4.2
U.S. DOT Regulations, 49 CFR 171-177	Governs the transportation of hazardous materials, including the marking of the transportation vehicles.	See Section 5.15.4.1 Traffic and Transportation
State		
Health and Safety Code Section 25500, et seq. (Waters Bill)	Requires preparation of an HMBP if hazardous materials are handled or stored in excess of TQ.	Section 5.15.4.2
Health and Safety Code Section 25531, et seq. (La Follette Bill)	Requires registration of facility with local authorities and preparation of an RMP if hazardous materials stored or handled in excess of TQ.	Section 5.15.4.2
CCR, Title 8, Section 5189	Facility owners are required to implement safety management plans to ensure safe handling of hazardous materials.	Section 5.15.4.2
California Uniform Building Code	Requirements regarding the storage and handling of hazardous materials.	Section 5.15.4.2
California Government Code Section 65850.2	Restricts issuance of COD until facility has submitted an RMP.	Section 5.15.4.2

TABLE 5.15-4**(CONTINUED)**

LORS	Applicability	Conformance (Section)
Local		
Los Angeles County Code, Chapter 12.64	Requires new/modified businesses to complete a business plan, waste minimization plan, and RMP prior to final plan/permit approval.	Section 5.15.4.3
	Requires a conditional use permit for businesses handling acutely hazardous materials in excess of TQ (55 gals, 500 lbs, or 200 cuft).	Section 5.15.4.3
City of Burbank Municipal Code, Section 15.1-8000 Unified Hazardous Waste and Hazardous Materials Management Regulatory Program	Regulates enforcement responsibility for the implementation of Title 23, Division 3, Chapter 16 and 18 of CCR, as it relates to hazardous material storage and petroleum UST cleanup.	Section 5.15.4.3
Industry Standards:		
Uniform Fire Code, (Articles 79 and 80)	Requirements for secondary containment, monitoring, etc. for extremely hazardous materials.	Section 5.15.4.4

system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility (see 40 CFR, Section 68.115). The requirements of these Acts are reflected in the California Health and Safety Code, Section 25531 et seq.

Title 49, Code of Federal Regulations, Parts 171-177, govern the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.

5.15.4.2 State

The California Health and Safety Code, Section 25500, requires companies that handle hazardous materials in sufficient quantities to develop a HMBP. The facility maintains a HMBP that includes the basic information on the location, type, quantity, and health risks of hazardous materials handled, stored, used, or disposed of that could be accidentally released into the environment. It also includes a plan for training new personnel, and for annual training of all personnel in safety procedures to follow in the event of a release of hazardous materials. It also includes an emergency response plan and identifies the business

representative able to assist emergency personnel in the event of a release. The current HMBP will be updated to reflect the construction and operation of the MPP.

The California Health and Safety Code, Section 25531, directs facility owners storing or handling acutely hazardous materials in reportable quantities to develop an RMP and submit it to appropriate local authorities, the EPA, and the designated local Administering Agency for review and approval. The RMP includes: an evaluation of the potential impacts associated with an accidental release; the likelihood of an accidental release occurring, the magnitude of potential human exposure; any pre-existing evaluations or studies of the material; the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan and is known as the California Accidental Release Program. The MPP will develop and submit an RMP prior to operation of the MPP.

The CCR, Title 8, Section 5189, requires facility owners to develop and implement effective Safety Management Plans to ensure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

California Government Code Section 65850.2, states that a city or county shall not issue a final certificate of occupancy unless there is verification that the applicant has met the applicable requirements of Health and Safety Code, Section 25531 and requirements, if any, for a permit from the air pollution control district.

The Uniform Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit.

5.15.4.3 Local

Los Angeles County Code Chapter 12.64, Hazardous Materials Disclosure and Risk Management, requires new or modified businesses to complete a business plan, waste minimization plan, and if applicable, an RMP prior to final approval of a land use permit for a new business or modification of an existing business. Because certain quantities of acutely hazardous materials could pose a threat to the public health and safety and the environment, Los Angeles County Code Chapter 12.64, requires a conditional use permit for all businesses or government facilities handling acutely hazardous materials in excess of 55 gallons, 500 pounds, or 200 cubic feet.

The designated certified unified program agency (CUPA) for the MPP site is the Los Angeles County Fire Department (LACFD), which has delegated the authority to administer state and

federal programs to the COB Fire Department. The COB Fire Department regulates: (1) the implementation of the hazardous material inventory and emergency response plan; and (2) the storage of hazardous materials in underground storage tanks and cleanup of petroleum releases. The COB Fire Department will be contacted in the event of a release of hazardous wastes or materials to the environment. The City also assumes enforcement responsibility for the implementation of CCR, Title 23.

5.15.4.4 Industry Standards

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. Article 80 was extensively revised in the latest edition (1994). These articles contain requirements that are generally similar to those contained in the California Health and Safety Code Section 25531 et seq. The UFC does, however, contain unique requirements for secondary containment, monitoring, and treatment of toxic gases emitted through emergency venting. These unique requirements are generally restricted to extremely hazardous materials.

5.15.4.5 Agencies and Agency Contacts

There are a number of federal and state agencies that regulate hazardous materials, including the EPA at the federal level and the California/EPA at the state level. However, local agencies are the primary enforcers of hazardous materials laws. For the MPP site, the local agency is the COB and the contact is shown in Table 5.15-5.

TABLE 5.15-5
AGENCY CONTACT

Agency	Contact	Title	Telephone
City of Burbank Fire Department	Devin Burns	HazMat Inspector	(818) 238-3473
County of Los Angeles Fire Department	David Baltazar	HazMat Supervisor	(818) 364-7126
Department of Toxic Substance Control	Andre Amy	DTSC Duty Officer	(818) 551-2830

5.15.4.6 Permits Required and Permit Schedule

The existing COB generating station has hazardous materials plans and permits in place. These plans are periodically updated when changes occur (e.g., equipment, responsible personnel). The COB facility will update its existing HMBP prior to startup of the MPP and submit it to the COB Fire Department (see contact in Table 5.15-5). The most recent copy of the HMBP is included as Appendix M.

The MPP will submit an RMP prior to the storage of aqueous ammonia onsite. See Table 5.15-6 for a list of potential permit requirements.

TABLE 5.15-6
PERMIT TABLE FOR HAZARDOUS MATERIALS

Jurisdiction	Potential Permit Requirement
Federal	No permits required (at this time)
State	Risk Management Plan
Local	Hazardous Materials Business Plan (in place, to be updated) Consolidated Permit/License to Operate – Aboveground Storage Tank Program, Hazardous Materials Disclosure Program.

5.15.5 References

City of Burbank. 2000. Hazardous Materials Business Plan.

Lees, F.P. 1983. *Loss Prevention in the Process Industries*. Volumes I and II. Butterworths.

Lewis, Richard J., Sr. 1992. *Sax's Dangerous Properties of Industrial Materials. Eighth Edition*. Van Nostrand Reinhold. New York, New York.

National Institute of Occupational Safety and Health. 1997. NIOSH Pocket Guide To Chemical Hazards. DHHS Publication No. 97-140. U.S. Government Printing Office. Washington, D.C.

U.S. Environmental Protection Agency. 1999. Risk Management Program Guidance for Offsite Consequence Analysis. EPA Document EPA550B99009. April, 1999.

1996. RMP Offsite Consequence Analysis Guidance. EPA Document EPA550B96014. May 24, 1996.

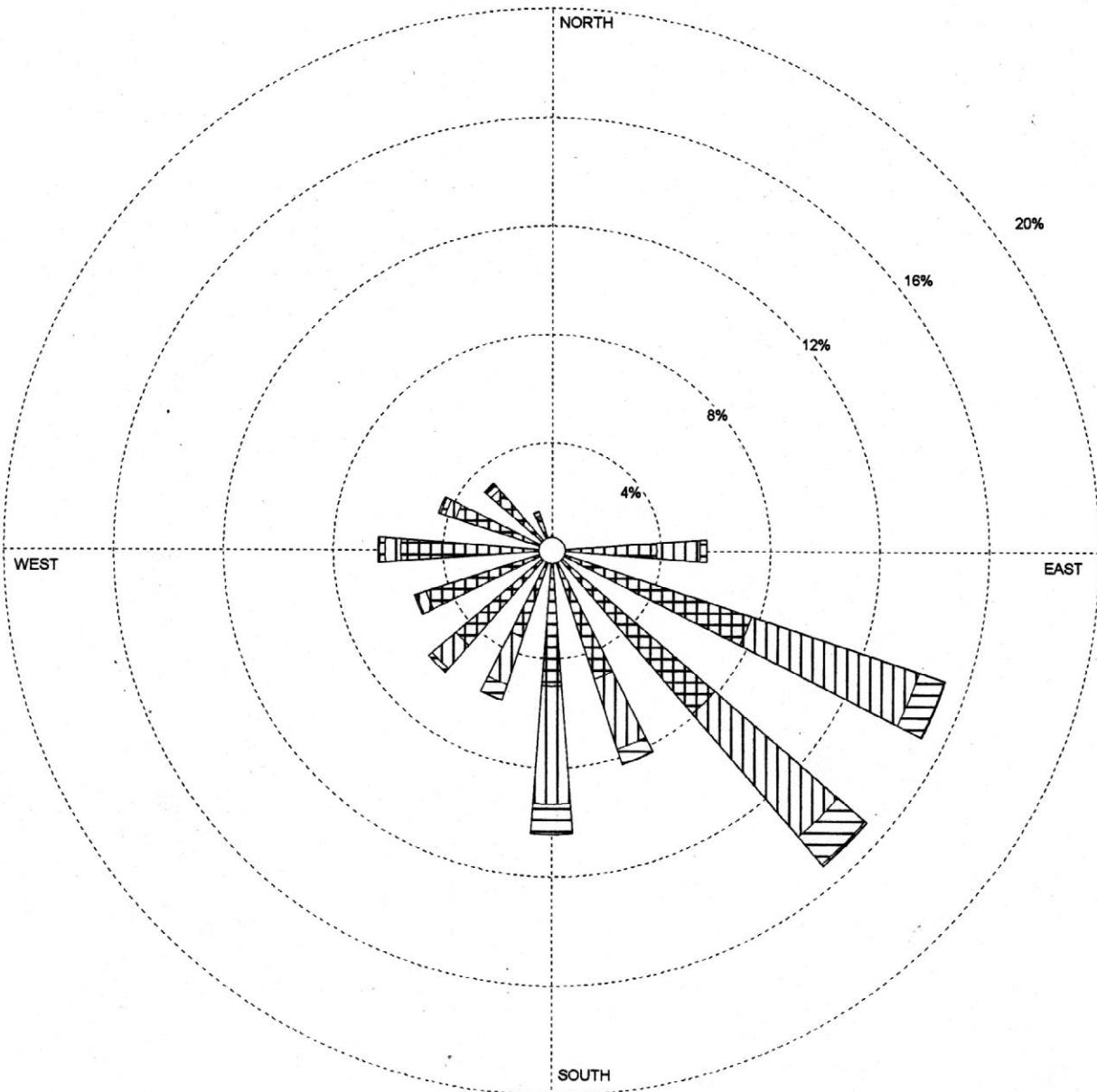
1995. SCREEN3 Model User's Guide. EPA-454/B-95-004. September 1995.

1993. Guidance on the Application of Refined Dispersion Models to Hazardous/Toxic Air Pollutant Releases. EPA-454/R-93-002. April 30, 1993.

Wray, Thomas, K. 1991. "HazMat Chemist: Ammonia." *HazMat World*. p. 86. November.

WIND ROSE PLOT

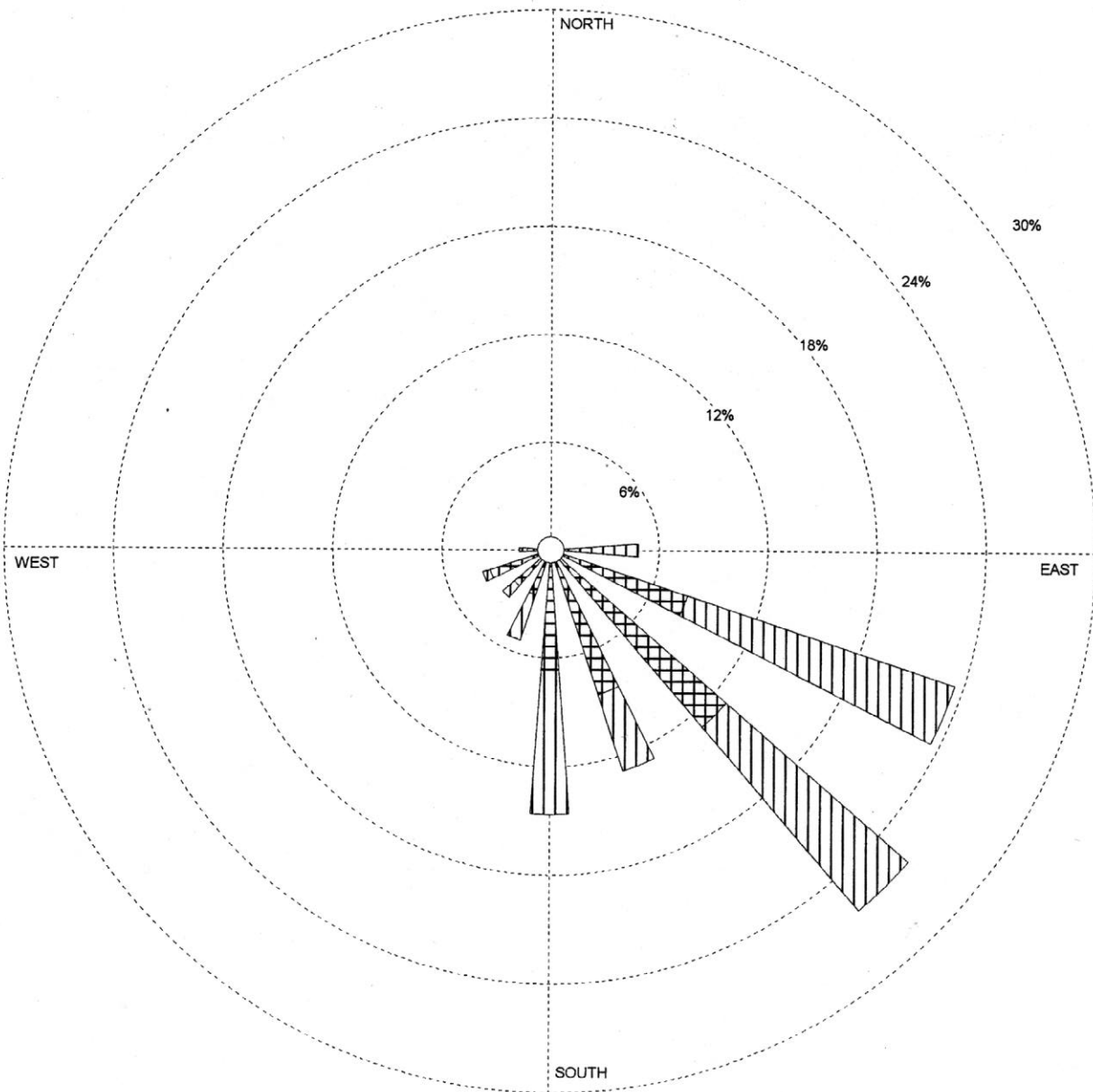
STATION #51100 - Burbank, CA




<p>Wind Speed (m/s)</p>	<p>MODELER vjh</p>	<p>DATE 2/28/01</p>	<p>MAGNOLIA POWER PROJECT</p>
	<p>DISPLAY Wind Speed</p>	<p>UNIT m/s</p>	<p>COMMENTS Annual Wind Rose</p>
	<p>AVG. WIND SPEED 1.89 m/s</p>	<p>CALM WINDS 10.14%</p>	
	<p>ORIENTATION Direction (blowing from)</p>	<p>PLOT YEAR-DATE-TIME 81 January 1 - December 31 Midnight - 11 PM</p>	<p>PROJECT/PLOT NO. Figure 5.15-1</p>

WIND ROSE PLOT

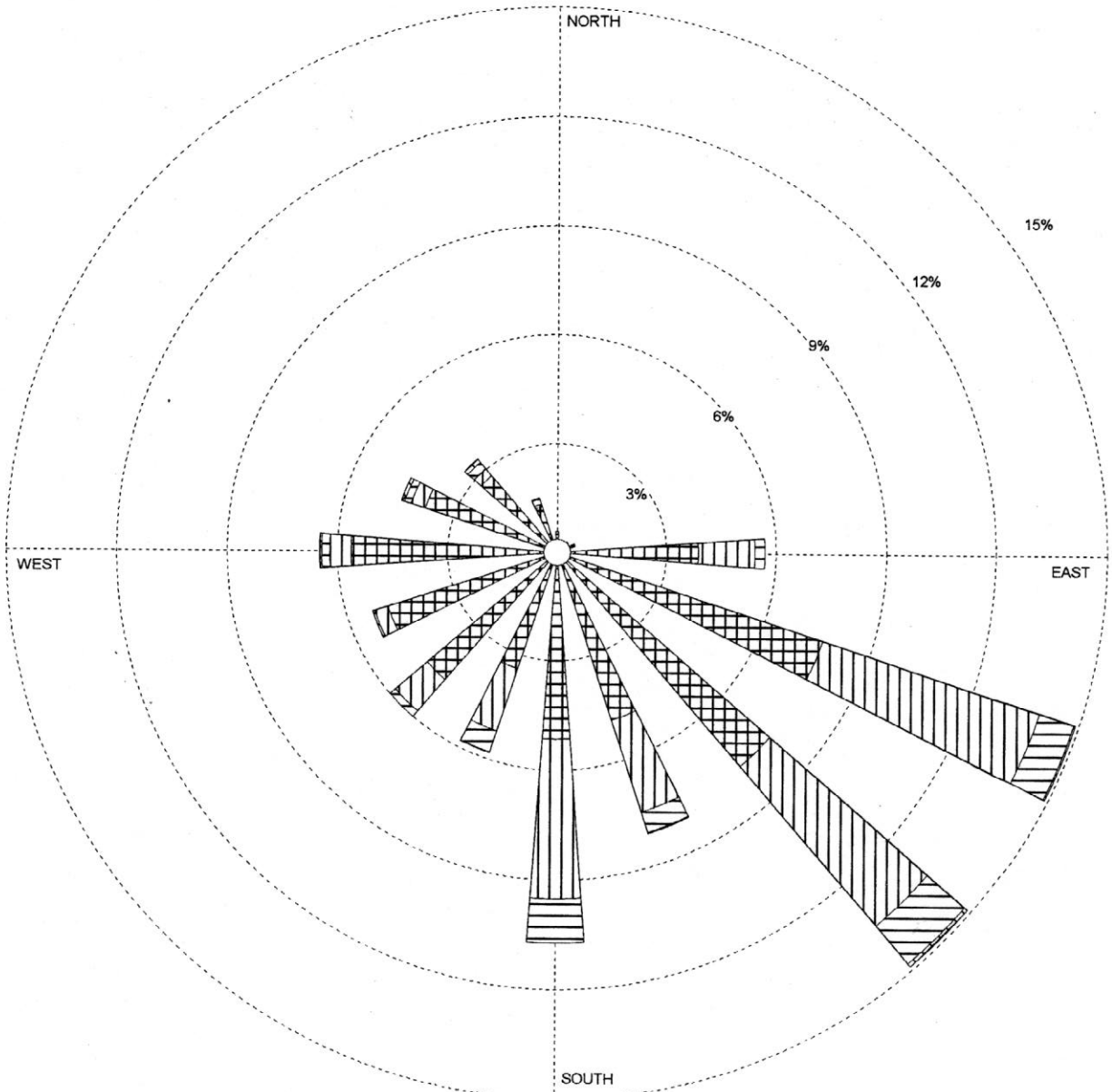
STATION #51100 - Burbank, CA



Wind Speed (m/s) 	MODELER vjh	DATE 2/28/01	MAGNOLIA POWER PROJECT
	DISPLAY Wind Speed	UNIT m/s	COMMENTS Stability Class A Wind Rose
	AVG. WIND SPEED 1.91 m/s	CALM WINDS 1.78%	
	ORIENTATION Direction (blowing from)	PLOT YEAR-DATE-TIME 81 January 1 - December 31 Midnight - 11 PM	PROJECT/PLOT NO. <div style="text-align: center; font-size: 1.2em; font-weight: bold;">Figure 5.15-2</div>

WIND ROSE PLOT

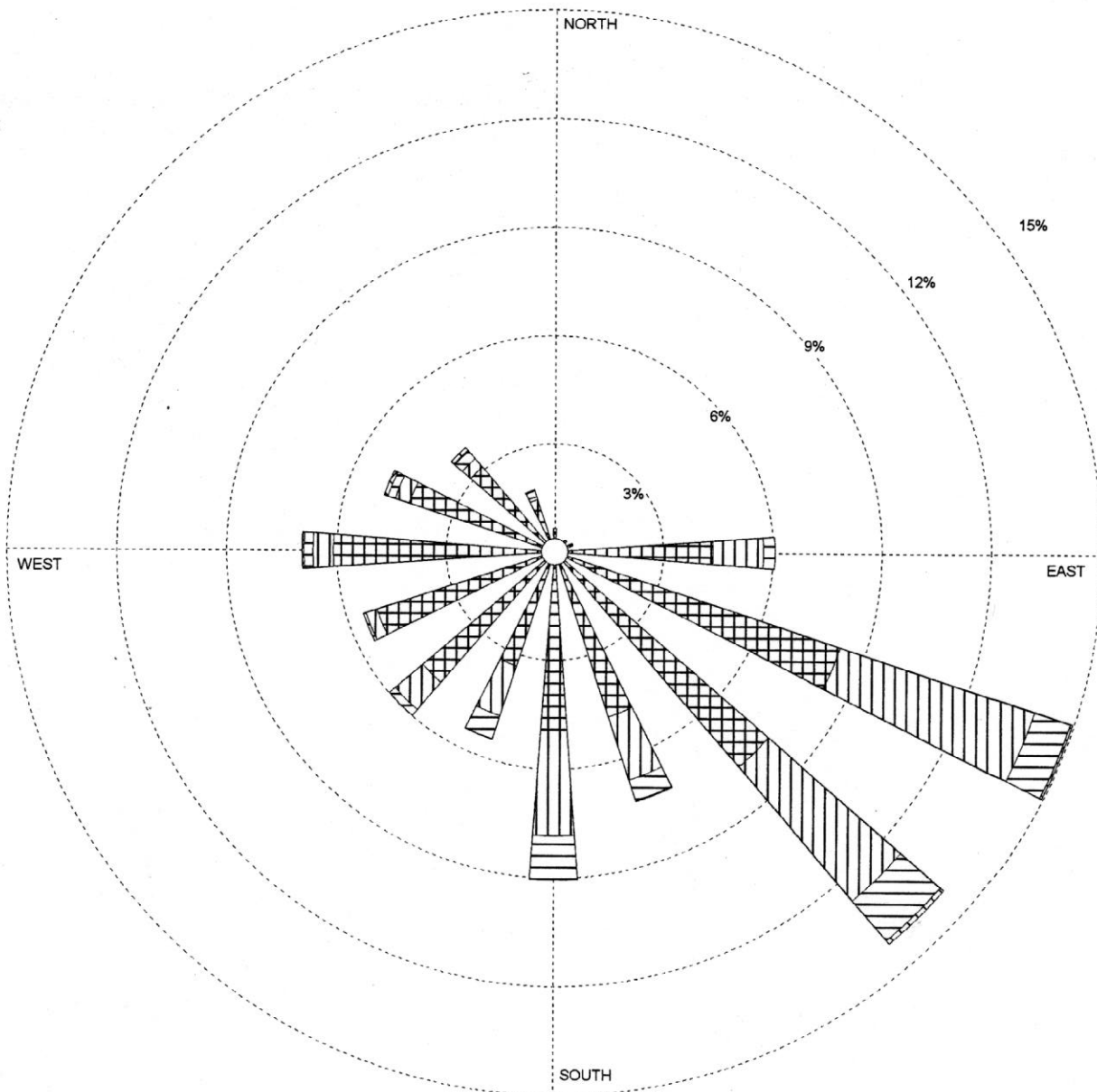
STATION #51100 - Burbank, CA



<p>Wind Speed (m/s)</p>	<p>MODELER vjh</p>	<p>DATE 2/28/01</p>	<p>MAGNOLIA POWER PROJECT</p>
	<p>DISPLAY Wind Speed</p>	<p>UNIT m/s</p>	<p>COMMENTS Stability Class B Wind Rose</p>
	<p>AVG. WIND SPEED 1.89 m/s</p>	<p>CALM WINDS 10.35%</p>	
	<p>ORIENTATION Direction (blowing from)</p>	<p>PLOT YEAR-DATE-TIME 81 81 81 81 81 81 January 1 - December 31 Midnight - 11 PM</p>	<p>PROJECT/PLOT NO. Figure 5.15-3</p>

WIND ROSE PLOT

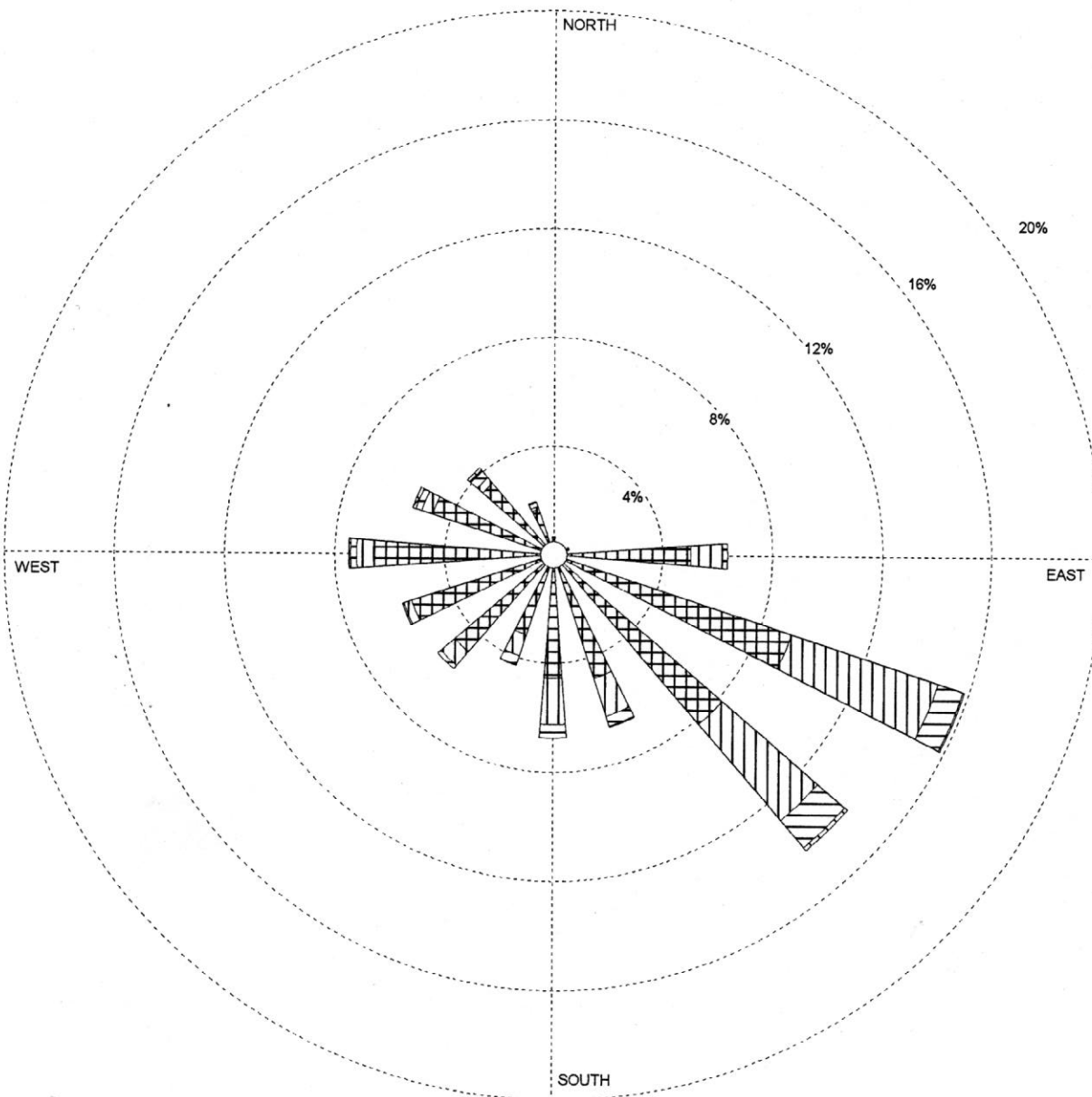
STATION #51100 - Burbank, CA



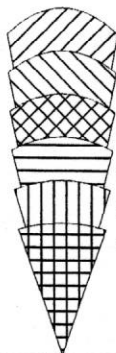
<p>Wind Speed (m/s)</p>	<p>MODELER vjh</p>	<p>DATE 2/28/01</p>	<p>MAGNOLIA POWER PROJECT</p>
	<p>DISPLAY Wind Speed</p>	<p>UNIT m/s</p>	<p>COMMENTS Stability Class C Wind Rose</p>
	<p>AVG. WIND SPEED 1.84 m/s</p>	<p>CALM WINDS 11.58%</p>	
	<p>ORIENTATION Direction (blowing from)</p>	<p>PLOT YEAR-DATE-TIME 81 81 81 81 81 January 1 - December 31 Midnight - 11 PM</p>	<p>PROJECT/PLOT NO. Figure 5.15-4</p>

WIND ROSE PLOT

STATION #51100 - Burbank, CA



Wind Speed (m/s)



> 10.8
8.8-10.8
5.7-8.8
3.6-5.7
2.1-3.6
0.5-2.1

MODELER

vjh

DATE

2/28/01

DISPLAY

Wind Speed

UNIT

m/s

AVG. WIND SPEED

1.75 m/s

CALM WINDS

12.61%

ORIENTATION

Direction
(blowing from)

PLOT YEAR-DATE-TIME

81 81 81 81
January 1 - December 31
Midnight - 11 PM

MAGNOLIA POWER PROJECT

COMMENTS

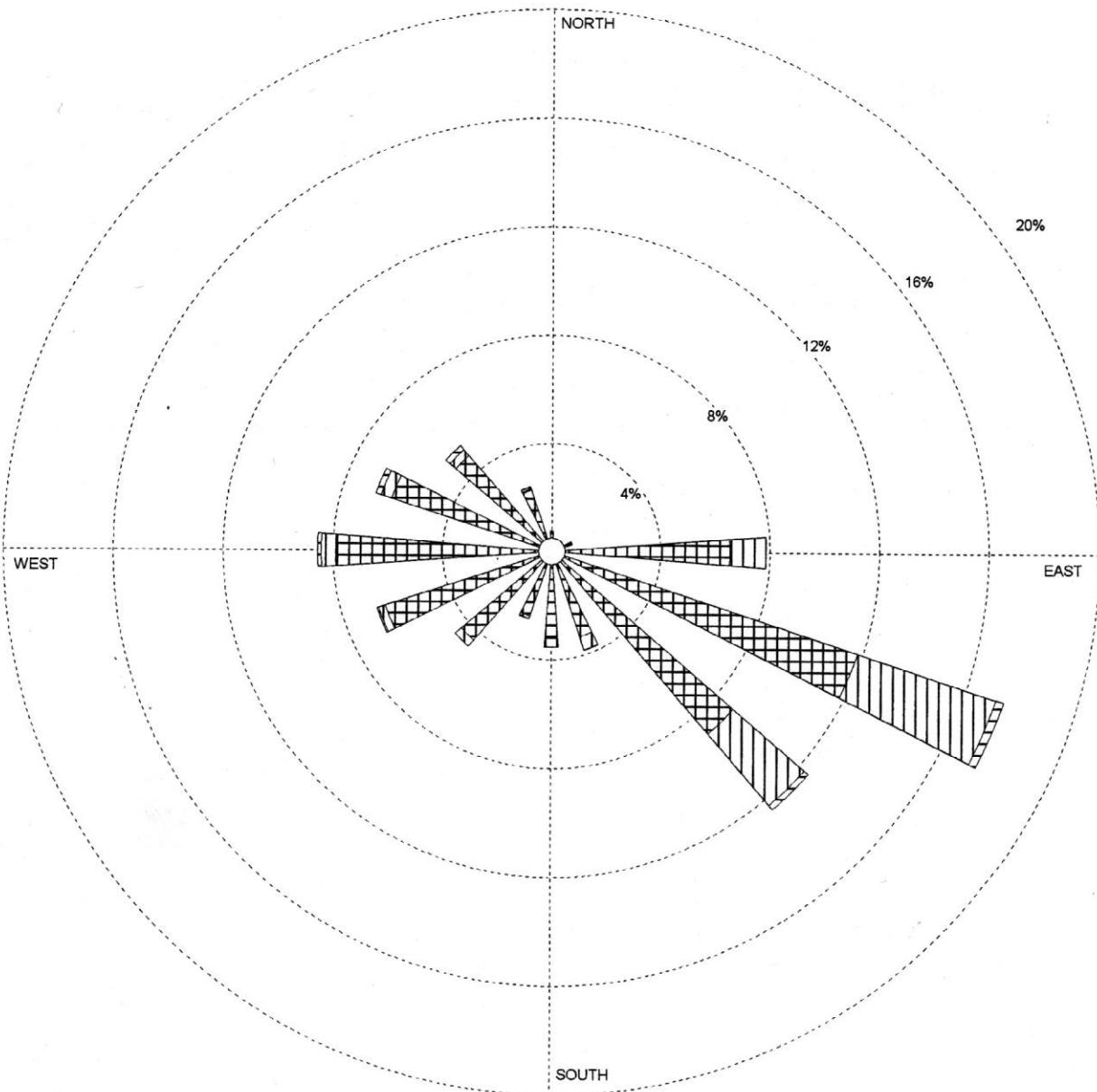
Stability Class D
Wind Rose

PROJECT/PLOT NO.

Figure 5.15-5

WIND ROSE PLOT

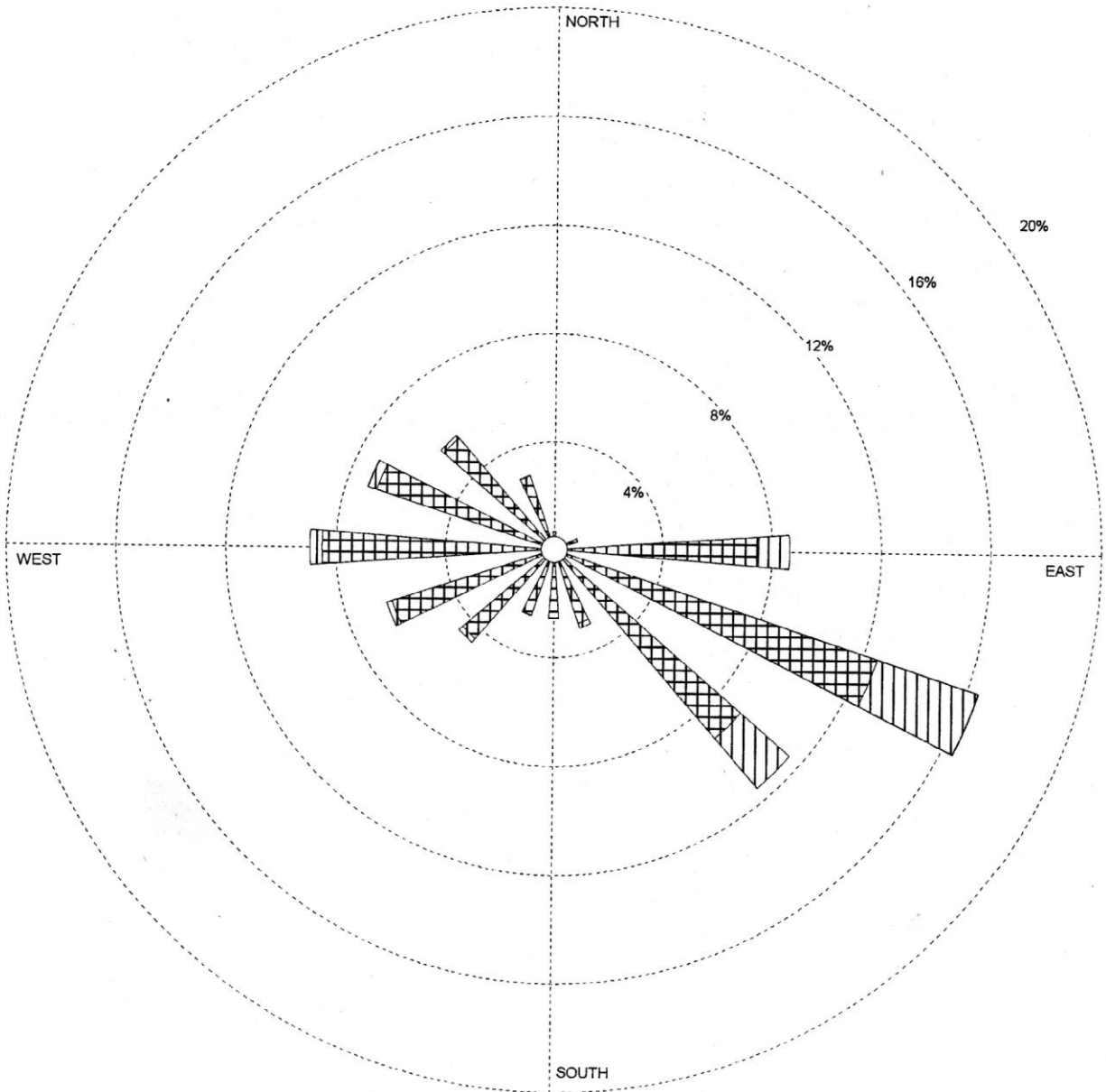
STATION #51100 - Burbank, CA



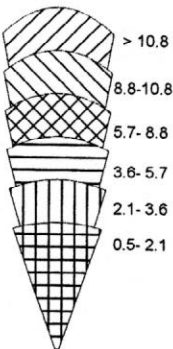
<p>Wind Speed (m/s)</p> <p>> 10.8 8.8-10.8 5.7-8.8 3.6-5.7 2.1-3.6 0.5-2.1</p>	<p>MODELER vjh</p>	<p>DATE 2/28/01</p>	<p>MAGNOLIA POWER PROJECT</p>
	<p>DISPLAY Wind Speed</p>	<p>UNIT m/s</p>	<p>COMMENTS Stability Class E Wind Rose</p>
	<p>AVG. WIND SPEED 1.46 m/s</p>	<p>CALM WINDS 15.40%</p>	
	<p>ORIENTATION Direction (blowing from)</p>	<p>PLOT YEAR-DATE-TIME 81 81 81 January 1 - December 31 Midnight - 11 PM</p>	<p>PROJECT/PLOT NO. Figure 5.15-6</p>

WIND ROSE PLOT

STATION #51100 - Burbank, CA



Wind Speed (m/s)



MODELER

vjh

DATE

2/28/01

MAGNOLIA POWER PROJECT

DISPLAY

Wind Speed

UNIT

m/s

COMMENTS

**Stability Class F
Wind Rose**

AVG. WIND SPEED

1.33 m/s

CALM WINDS

17.26%

ORIENTATION

**Direction
(blowing from)**

PLOT YEAR-DATE-TIME

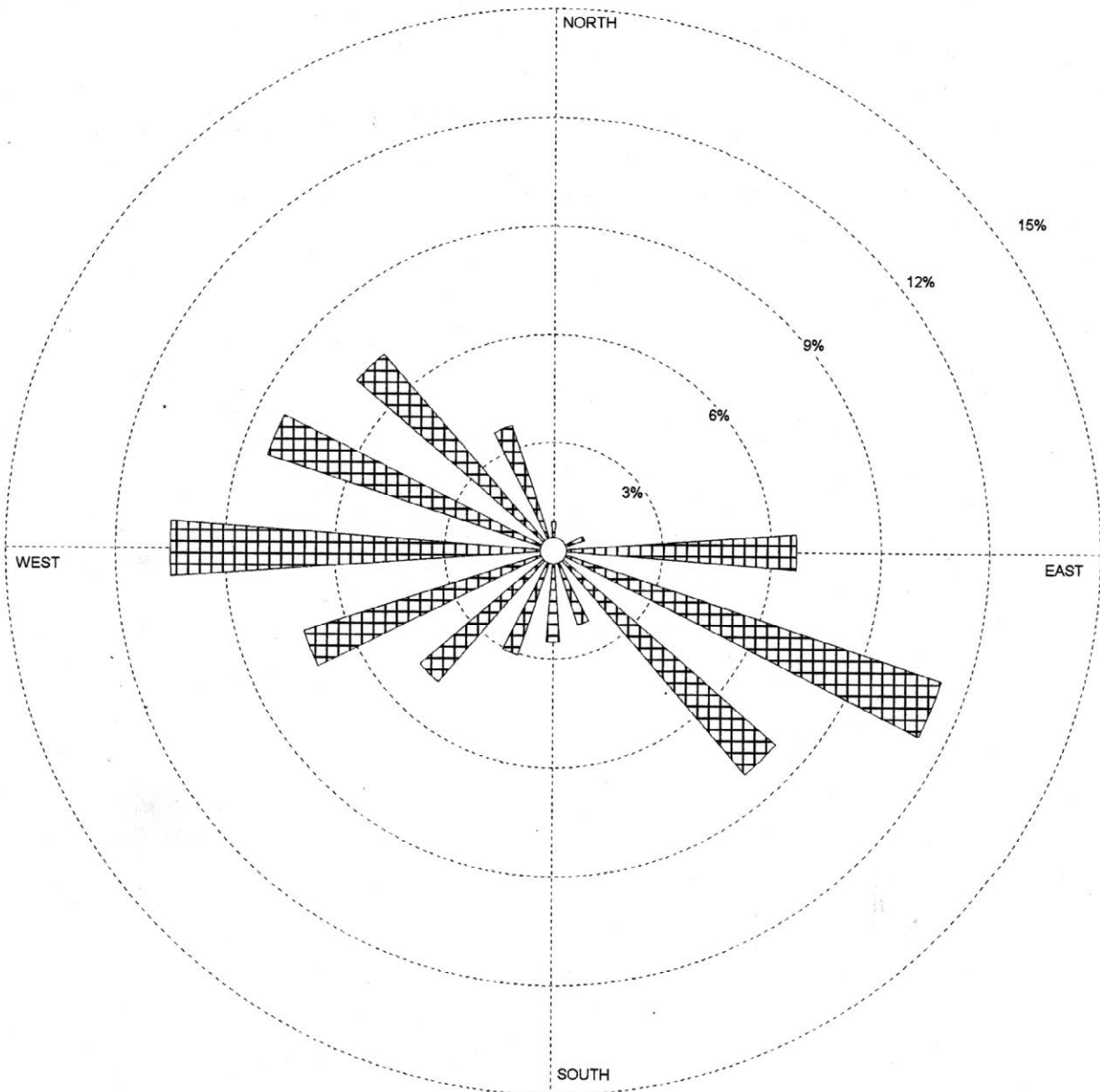
**81 81
January 1 - December 31
Midnight - 11 PM**

PROJECT/PLOT NO.

Figure 5.15-7

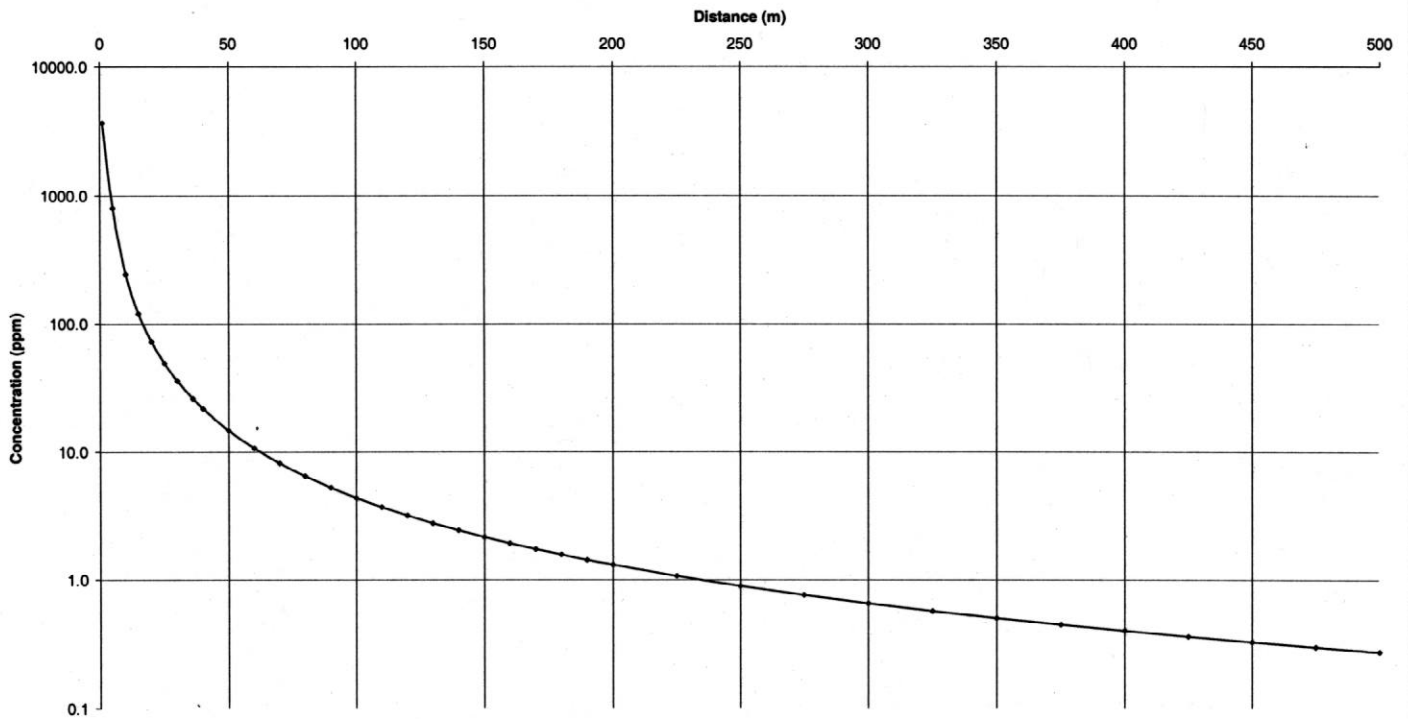
WIND ROSE PLOT

STATION #51100 - Burbank, CA

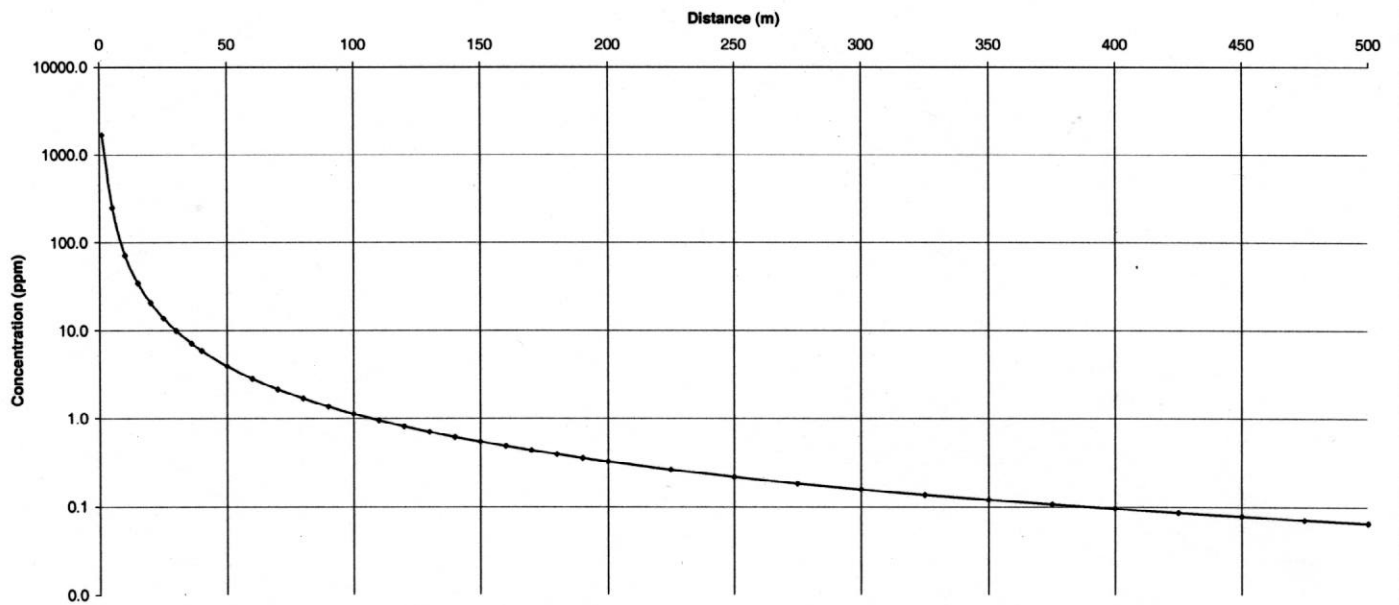


<p>Wind Speed (m/s)</p>	<p>MODELER vjh</p>	<p>DATE 2/28/01</p>	<p>MAGNOLIA POWER PROJECT</p>
	<p>DISPLAY Wind Speed</p>	<p>UNIT m/s</p>	<p>COMMENTS Stability Class G Wind Rose</p>
	<p>AVG. WIND SPEED 1.09 m/s</p>	<p>CALM WINDS 22.23%</p>	
	<p>ORIENTATION Direction (blowing from)</p>	<p>PLOT YEAR-DATE-TIME 81 January 1 - December 31 Midnight - 11 PM</p>	<p>PROJECT/PLOT NO. Figure 5.15-8</p>

Ammonia Unloading Accident
(Ambient Temperature 110°F Stability; 1.5 m/s wind speed)



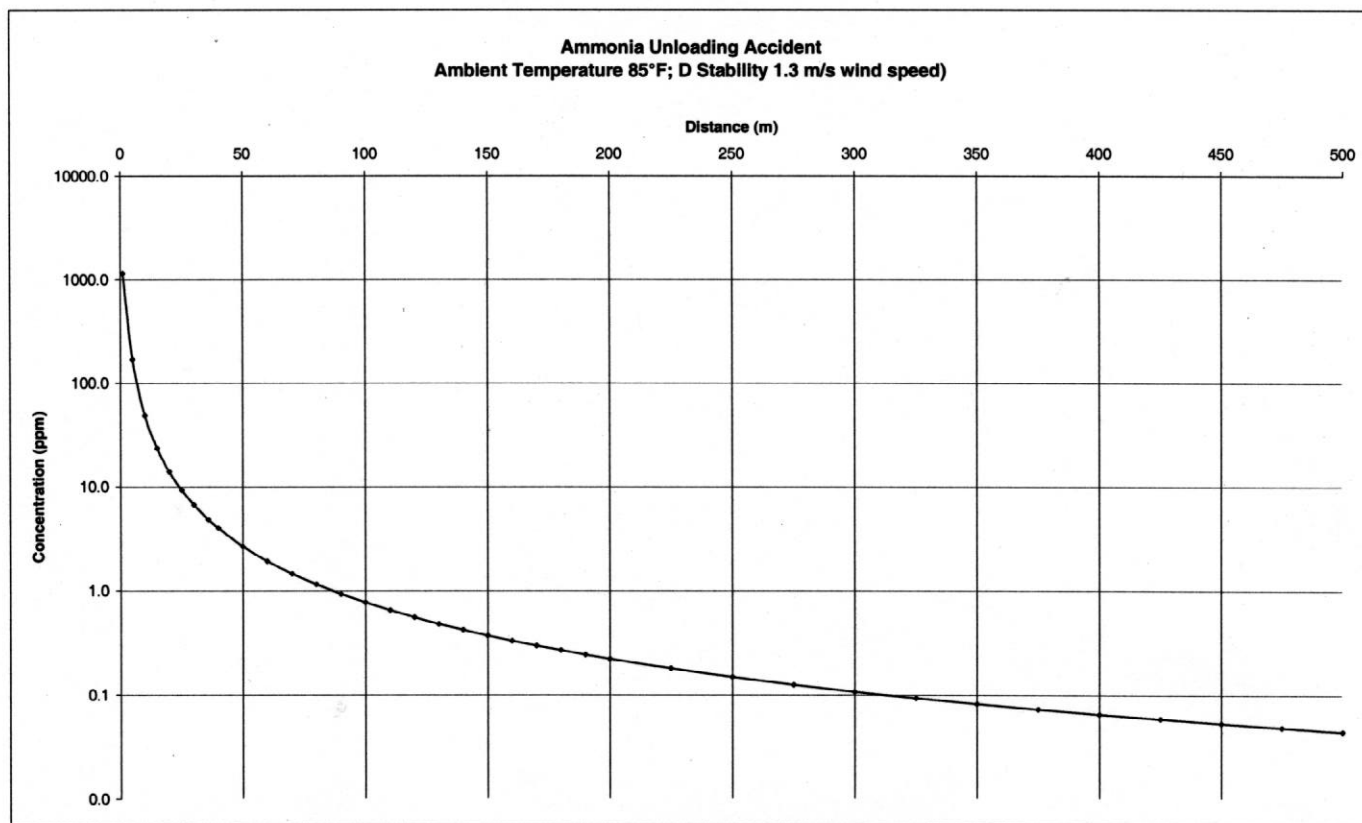
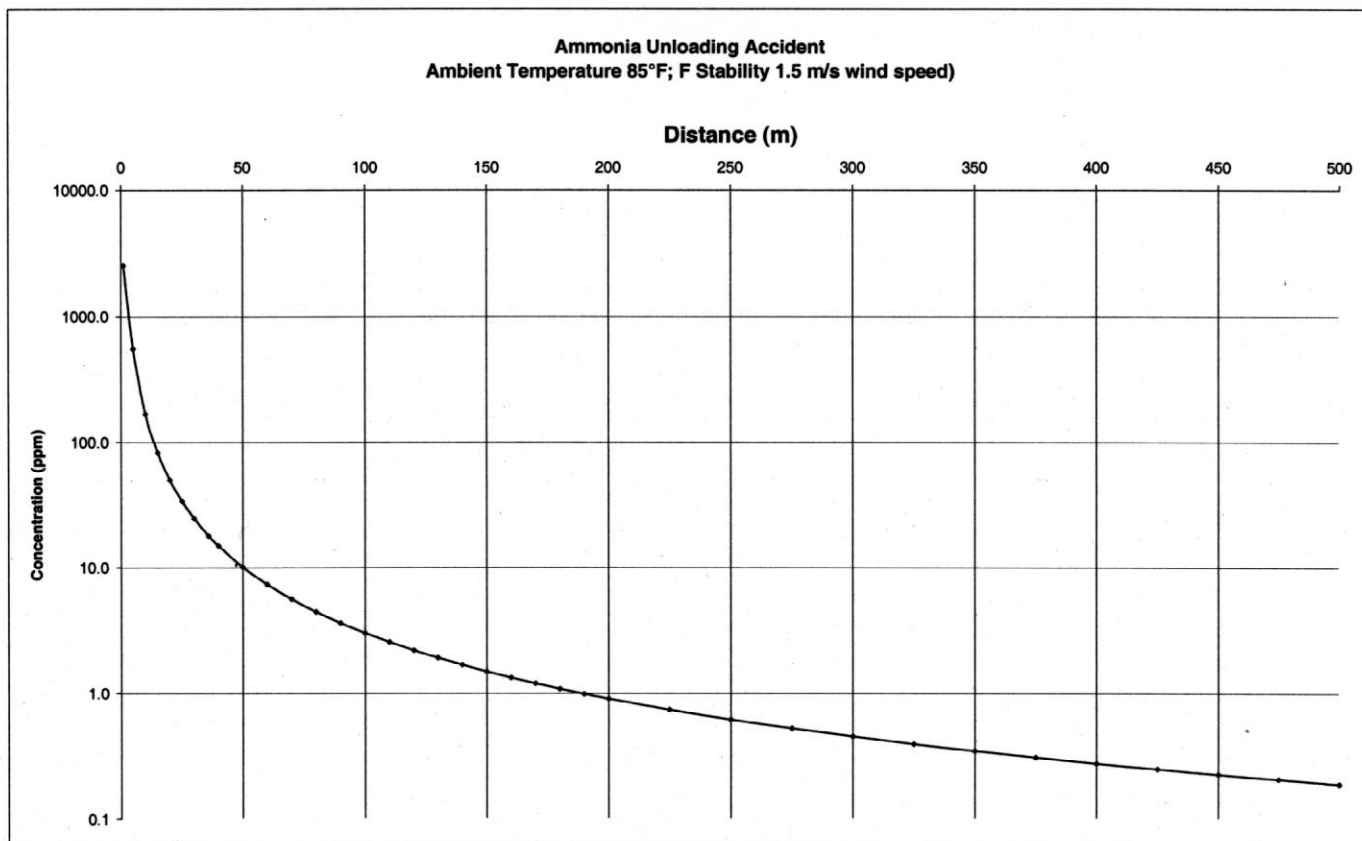
Ammonia Unloading Accident
(Ambient Temperature 110° D Stability; 1.3 m/s wind speed)



Magnolia Power Project

Figure 5.15-9: Ammonia Concentrations
(Ambient Temperature 110°F)

March
2001

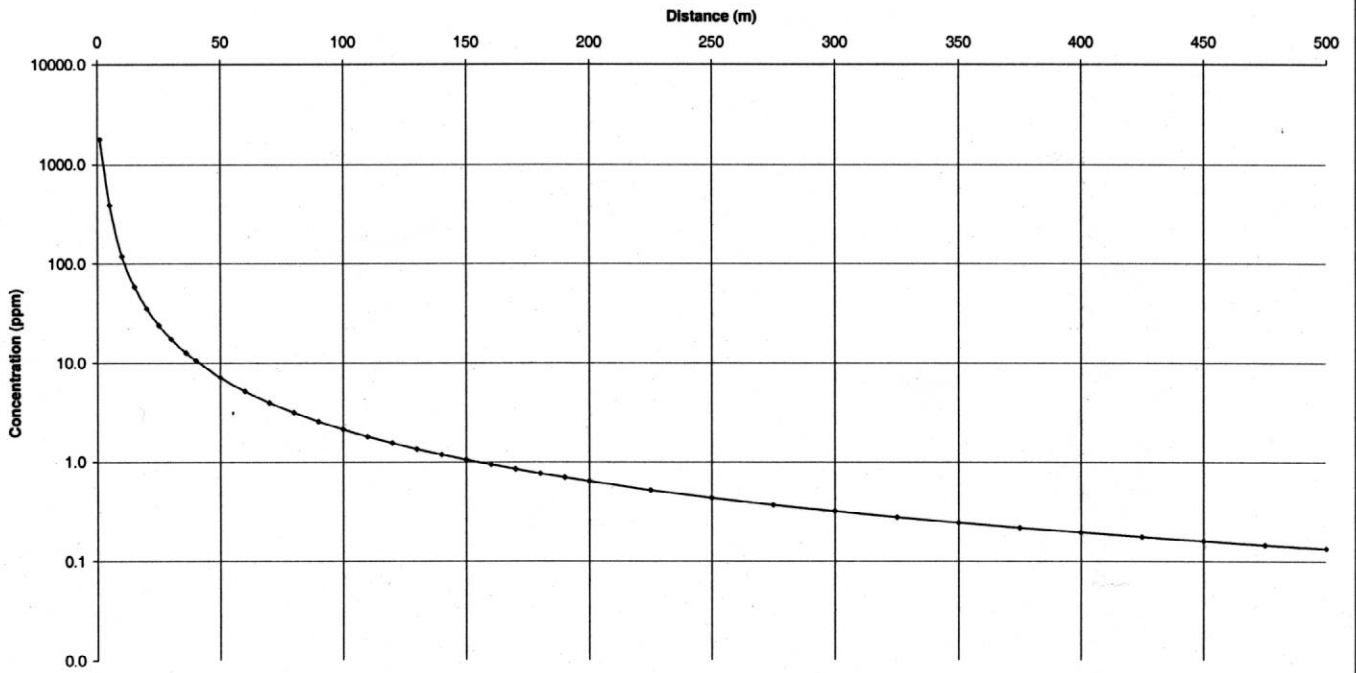


Magnolia Power Project

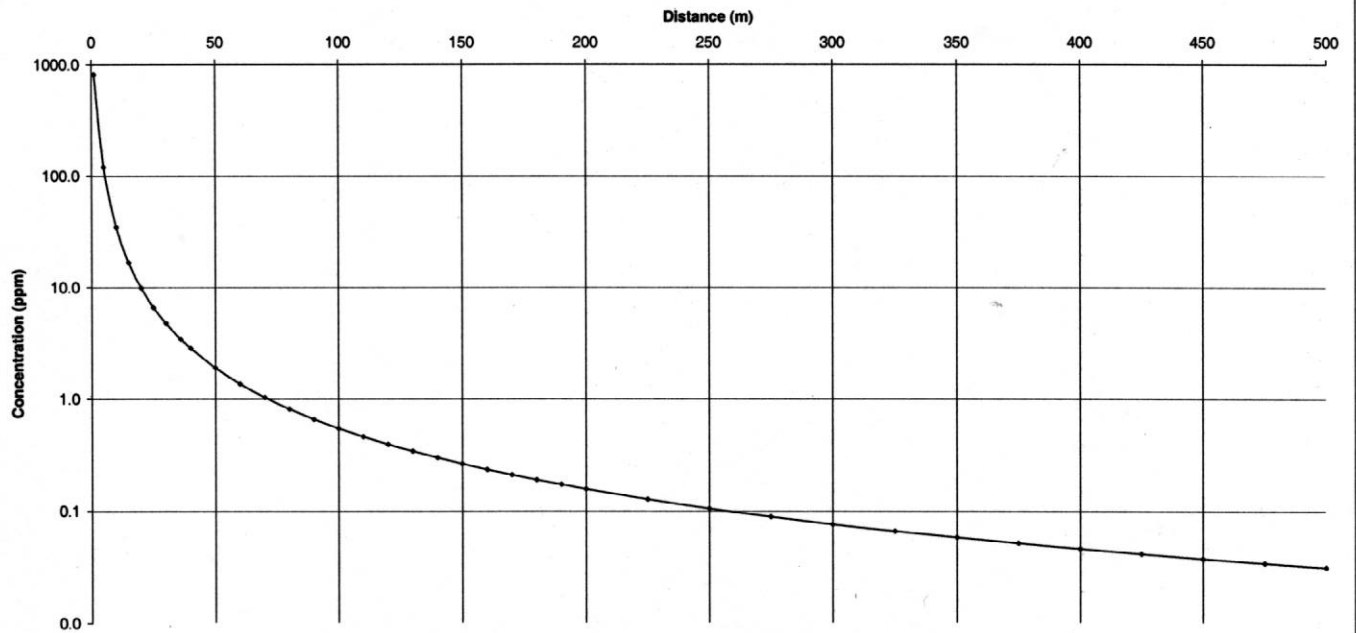
Figure 5.15-10: Ammonia Concentrations
(Ambient Temperature 67°F)

March
2001

Ammonia Unloading Accident
(Ambient Temperature 67°F; F Stability 1.5 m/s wind speed)



Ammonia Unloading Accident
(Ambient Temperature 67°F; D Stability 1.3 m/s wind speed)



Magnolia Power Project

Figure 5.15-11: Ammonia Concentrations
Temperature 67°F)

(Ambient

March
2001